

REMARKS

This application is believed to be in condition for allowance for the reasons discussed below.

**Status of the Claims**

Claims 5, 6, 9, 13-16 and 18-21 remain pending in the application.

**Claim Rejections-35 USC §103**

Claims 5, 6, 9, 13-16 and 18-21 are rejected under 35 U.S.C. §103(a) as being unpatentable over CARBO et al. U.S. Patent No. 4,507,339(CARBO) in view of UCHIDA et al. U.S. Patent No. 4,248,676(UCHIDA) and OHMI US Patent No. 5,656,099(OHMI). This rejection is respectfully traversed.

The positions of the Official Action was that it would have been obvious to (1) have filled pin holes in the passivation film of Carbo as taught by Uchida in order to prevent crack formations during general processing and (2) have used a chromium oxide as the passivation film in the combination of CARBO and UCHIDA as taught by OHMI because of the improved corrosion resistance gained by layer consisting only of chromium oxide. Since the passivation film consists of chromium oxide at least approximately 30 nm from an outermost surface of the chromium-oxide passivation film will consist of 100% chromium-oxide.

However, one cannot arrive at the claimed invention based on these three documents, as these documents utilize processes that produce films different from the claimed film structure.

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979).

The claimed invention concerns a chromium-oxide passivation film providing an outermost surface to a metallic material, and the claimed structure depends on the process steps by which it is made. The chromium oxide passivation film is formed by coating directly onto the metallic material surface a chromium film having a thickness of at least 100nm, baking the chromium film directly onto the metallic material surface at a temperature of 100°C to 200°C and heating the baked chromium film coated directly onto the metallic material surface in an oxidizing atmosphere. As a result, the metallic body surface defines a continuous boundary between the metallic body and the chromium-oxide deposit, and the chromium-oxide passivation film is substantially 100% chromium oxide approximately 30 nm from the

outermost surface. The chromium of said baked chromium film which is not oxidized remains between the chromium-oxide passivation film and the metallic material, and the chromium remains adhered to the metallic material so that the chromium-oxide passivation film is coupled to the metallic material.

CARBO and UCHIDA, however, relate to a chromate process, and, as such, they produce a film compositionally different from the chromium oxide passivation film according to the claimed invention. Thus, beginning with these documents, there is no suggestion to modify the process such that one could even approach the claimed invention.

While OHMI discloses a chromium oxide film, the thickness is much less than the presently claimed film. That is, in OHMI the thickest film disclosed is 8nm (e.g., Embodiment 4), whereas the claimed invention has a thickness of at least 30nm.

Indeed, the method according to OHMI cannot manufacture as thick of a film as claimed because the chromium in OHMI is moved from the basic material to the surface. But in the present claims, the chromium is applied first as a coating onto the basic material, and the passive film is formed by the diffusion of the oxygen from the outer surface of the chromium coating. That is, the chromium present is not moved.

Thus, one would not have been able to arrive at the claimed film/metallic material structure based on CARBO, UCHIDA

and OHMI, and the combination does not render obvious the claimed invention.

**Conclusion**

In view of the foregoing remarks, the application is in condition for allowance at the time of the next Official Action. Allowance and passage to issue on that basis is respectfully requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future submissions, to charge any deficiency or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

/Robert A. Madsen/  
Robert A. Madsen, Reg. No. 58,543  
Customer No. 00466  
209 Madison Street, Suite 500  
Alexandria, VA 22314  
Telephone (703) 521-2297  
Telefax (703) 685-0573  
(703) 979-4709

RAM/dl